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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,858	08/01/2003	Kazunari Honma	024808-00014	9152

7590 06/13/2005

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EXAMINER I

WEISS, HOWARD

ART UNIT PAPER NUMBER

2814

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/631,858	HONMA ET AL.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 ~~is~~ are pending in the application.
- 4a) Of the above claim(s) 11-21 ~~is~~ are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 ~~is~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0405</u> . | 6) <input type="checkbox"/> Other: _____ |

Attorney's Docket Number: 024808-00014

Filing Date: 8/1/03

Continuing Data: none

Claimed Foreign Priority Date: 8/12/02 (JPX)

Applicant(s): Honma et al. (Matsushita)

Examiner: Howard Weiss

Information Disclosure Statement

1. The information disclosure statement filed 6 April 2005 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent or non-patent literature listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered. In particular, Reference AM has not been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 to 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (U.S. Patent No. 6,783,998) and Fukaya et al. (U.S. Patent No. 4,581,099).

Nakamura shows most aspects of the instant invention (e.g. Figure 1(a) and Column 4 Lines 36 to 67) including:

- a first electrode **1** containing PT and formed by etching using fluoride gas which forms a platinum fluoride on its surface (Column 7 Line 58 to Column 8 Line 35)
- a ferroelectric film **2** of $\text{SRBi}_2\text{Ta}_2\text{O}_9$
- a second electrode **3**

Nakamura does not explicitly show the first electrode surface terminated by the fluorine atoms. Fukaya et al. teach (Column 4 Line 64 to Column 5 Line 2) that etching with halogen atoms, such as fluorine, terminates the material being etched. It would have been obvious to a person of ordinary skill in the art at the time of invention to terminate the surface of the first electrode of Nakamura since Fukaya et al. teach that etching with halogen atoms, such as fluorine, terminates the material being etched.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura and Fukaya et al., as applied to Claim 1 above, and further in view of Furukawa (JP 11-068057).

Nakamura and Fukaya et al. show most aspects of the instant invention (Paragraph 3) except for the bismuth layer being substantially perpendicular to said first electrode layer. Furukawa teaches (e.g. Figures 2 and 3) to have the bismuth layer being substantially perpendicular to said first electrode layer to provide a dielectric device with superior polarization characteristic (see PROBLEM TO BE SOLVED). It would have been obvious to a person of ordinary skill in the art at the time of invention to have the bismuth layer being substantially perpendicular to said first

electrode layer as taught by Furukawa in the device of Nakamura and Fukaya et al. to provide a dielectric device with superior polarization characteristic.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura and Fukaya et al., as applied to Claim 1 above, and further in view of Yamazaki et al. (U.S. Patent No. 6,046,469).

Nakamura and Fukaya et al. show most aspects of the instant invention (Paragraph 3) except for the adherent layer formed under the first electrode layer. Yamazaki et al. teach (e.g. Figure 1) to form an adherent layer **12,13** under a first electrode **14** to provide a semiconductor device with good ohmic characteristic (Column 2 Lines 40 to 44). It would have been obvious to a person of ordinary skill in the art at the time of invention to form an adherent layer under a first electrode as taught by Yamazaki et al. in the device of Nakamura and Fukaya et al. a semiconductor device with good ohmic characteristic.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura, Fukaya et al. and Yamazaki et al., as applied to Claim 1 above, and further in view of Kerlin et al. (U.S. Patent No. 6,320,213).

Nakamura and Fukaya et al. show most aspects of the instant invention (Paragraph 5) except for the adherent layer including IrSiN. Kerlin et al. teach (Column 4 Lines 57 to 67) to use IrSiN to reduce the diffusion of aluminum and platinum (Column 4 Lines 52 to 56). It would have been obvious to a person of ordinary skill in the art at the time of invention to use IrSiN in the device of Nakamura, Fukaya et al. and Yamazaki et al. to reduce the diffusion of aluminum and platinum.

Response to Arguments

7. Applicant's arguments filed 4/6/05 have been fully considered but they are not persuasive. In reference to the IDS submitted, Reference Am was not considered

because no translation nor concise explanation of the relevance of the reference was provided by the Applicants.

The Applicants state that the first (lower) electrode of Nakamura's device is not exposed during etching (being covered by either a mask or other layers) and, therefore, the formation of platinum fluoride and the subsequent surface termination of the electrode would be prevented. However, there are many etching processes available to one of ordinary skill in the art in which the surface of the electrode material is exposed. For example, Hwang et al. (U.S. Patent No. 6,323,132) describe (Column 6 lines 26 to 32) removing a mask during etching a platinum electrode layer and Fukaya et al. teach (Column 3 Lines 42 to 48) to remove the photoresist layer (i.e. mask) before subsequent etching. Nakamura leaves the method of etching up to one of ordinary skill in the art.

In reference to Furukawa, the examiner maintains that Furukawa teaches to have the bismuth layer being substantially perpendicular to said first electrode layer as outlined above. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing

date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

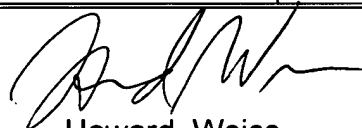
9. Paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.
10. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 872-9306**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via Howard.Weiss@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on **(571) 272-1705**.

Art Unit: 2814

12. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/295, 310	thru 6/8/05
Other Documentation: none	
Electronic Database(s): EAST, IEL	thru 6/8/05

HW/hw
8 June 2005



Howard Weiss
Primary Examiner
Art Unit 2814